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Seakindly furniture designs for yacht interiors

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SEAKINDLY FURNITURE DESIGNS

FOR

YACHT INTERIORS

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SEAKINDLY FURNITURE DESIGNS FOR YACHT INTERIORS

by

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DEDICATION

I would like to dedicate this thesis to my wife, Cydria, for the strength and support she has given me. I also would like to dedicate this thesis to my mother and father, Beverly and Kenneth White, who showed me the joy of working with my hands and kindled my love of ships and the sea.

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INTRODUCTION

Since days of old, comfort aboard a sailing vessel (admittedly, this thesis will be biased toward sailing vessels) has been a very challenging proposition. A yacht or seagoing vessel is basically a self-contained living environment. Within this environment is a search for the maximum amount of amenities within a minimum amount of space. Adding to and compounding the discomfort of this confined living space are the constant motion of both the vessel and the sea and the extended periods of time the boat travels heeled to one side or the other.

A wide range of comforts can be found within sailing vessels. An interior may have an extreme lack of amenities, as described in this excerpt from one of Richard Dana's writings, Two Years Before the Mast:

> I now began to feel the first discomforts of a sailor's life. The steerage in which I lived was filled with coils of rigging, spare sails, old junk and ship stores, which had not been stowed away. Moreover, there had been no berths built for us to sleep in, and we were not allowed to drive nails to hang our clothes upon.

> The sea, too, had risen, the vessel was rolling heavily, and everything was pitched about in grand confusion. There was a complete "hurrah's nest" as the sailors say, "everything on top and nothing at hand." A large hawser had been coiled away upon my chest; my hats, boots, mattress and blankets had all fetched away and gone over to leeward, and were jammed and broken under the boxes and coils of rigging. To crown all, we were allowed no light to find anything with and I was just beginning to feel strong symptoms of sea-sickness, and that listlessness and inactivity which accompany it. Giving up all attempts to collect my things together, I lay down upon the sails, expecting every moment to hear the cry of "all hands ahoy," which the approaching storm would soon make necessary. . . .[1]

Representing the other extreme is the first-class accomodation, pictured here, from the interior of Whitehawk, a 92 foot ketch designed by Bruce King (Figure 1, Plate I).

Just as the amounts of comforts vary, so do the concerns toward seakindliness. As defined in Gershom Bradford's The Mariner's Dictionary, "seakindly" is the "condition of a ship when she is in good trim and rides comfortably."[2] Placed within the context of a yacht interior, seakindly can be thought of as the systems, detailings, layouts, and aesthetics which bring about a maximum amount of comfort within a limited space. When considering this

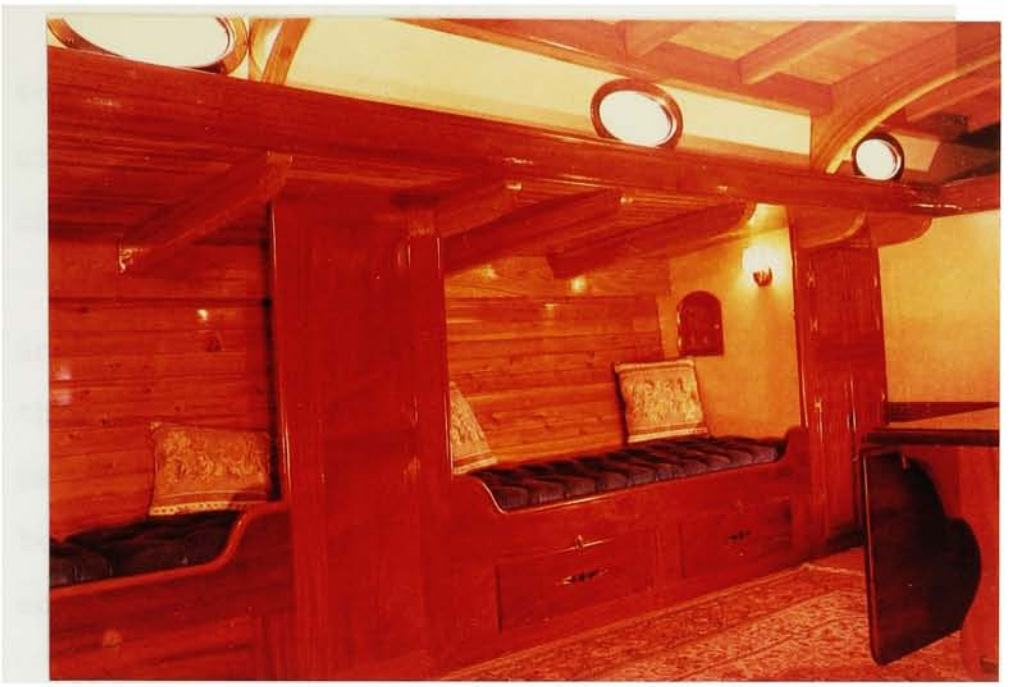


Figure 1. Whitehawk interior, courtesy Matthew Walker

PLATE I

totality, one would be wise to keep in mind all types of sea conditions, for it is in the roughest of these conditions that an interior must be the most seakindly.

Within historic as well as contemporary yacht interiors, probably the foremost seakindly device is the use of blunt and rounded edges and corners. Often, passage through the interior of a moving vessel can be teetery at best. Falling on unfinished sharp edges or corners could result in injury.

The most frequently used items within a yacht interior, old and new, are fiddles, raised edgings on table and counter tops. They function to keep dishes, crockery, utensils, whatever, from sliding off these top surfaces as the vessel pitches and rolls. Fiddles can be solidly attached or removable. The first are favored for they can be used somewhat as handholds. For optimum use while the vessel is under way, the fiddles should be at least $1\frac{1}{2}$ inches in height for a rigidly secured table or counter top but could be somewhat lower on their gimbaled counterparts. The face of the fiddle should always be at 90 degrees to the table or counter top.

The most sophisticated of seakindly notions, in my opinion, is gimbaling. Gimbaling is a means of suspending an object on bearings so the object can

remain level irrespective of the rolling or pitching of the vessel. Gimbals themselves, however, are not an entirely modern concept. The earliest description of a gimbal mounting dates from the beginning of the seventeenth century.[3]

When gimbaling a table or similar object, one should employ some sort of dampening system to counteract any rhythm the object might develop on its own. When the gimbaling is not wanted, there should be a means to lock the object in place. These two features enhance the seakindliness of the gimbaled piece. Once locked in a stationary position, that piece of furniture can be utilized more effectively as a handhold, aiding safe navigation through the interior. Knowing these areas are stable also helps psychologically.

There are numerous other interior seakindly elements. The overall layout of the pieces can make a big difference in the seakindliness of the interior space. Consideration must be given to the placement of the furnishings in relation to each other. Seating areas should be arranged to enable a person on a windward seat or settee to have a means of bracing himself from sliding off while the boat is on a particular angle of heel.

High gloss surfaces within the interior should be minimized. It is my feeling that on a bright, sunny day, the glare off the water and sails puts a great deal of strain on one's eyes. Keeping a high gloss off the majority of the interior surfaces helps to reduce the reflected glare down below, allowing the interior space to be more soothing.

Human factors should be followed carefully to optimize comfort. Being unable to stand up in the cabin, to stretch out completely and roll over in a berth without bumping hips or shoulders, or to sit comfortably at the dinette are just a few of the discomforts that add up to create physical and psychological strain and drain.

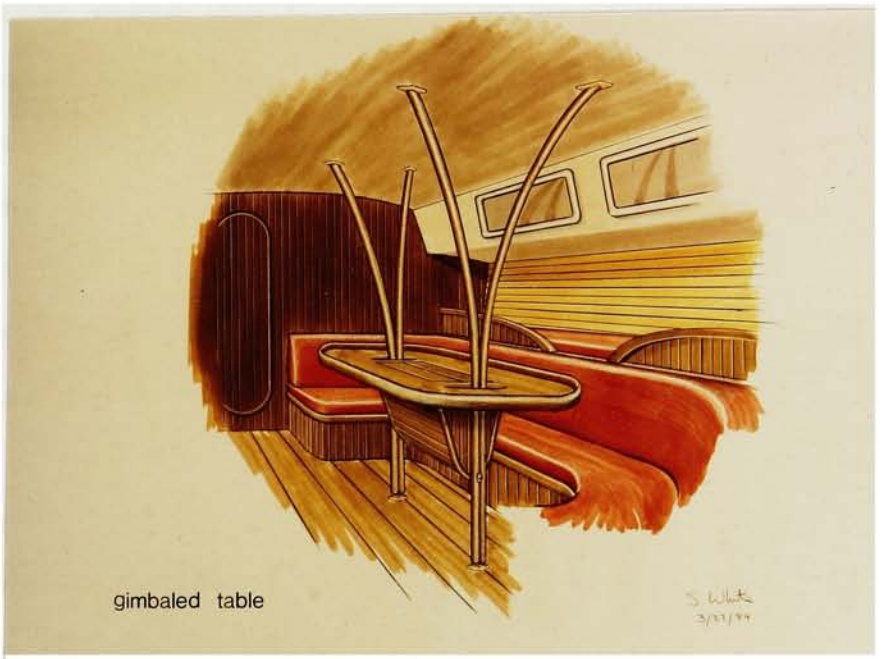
All these elements must be combined appropriately in the creation of a nautical interior. The space within the confines of a yacht interior is at a premium; so, the cabin furnishings must be well thought out. For me, the primary concern is function. If a piece is not functional, much of its appropriateness is lost. The form of an object is directly related to the function it serves, as stated succinctly in the saying "form follows function." Applied to yacht furnishings, this means the space allotment for each piece, the human factors, and the mechanical

requirements must be established first. The form develops as a result of these functions, and then the aesthetic properties unfold.

For me, this means starting with all the above-mentioned criteria--space, human, mechanical--and then exploring the different ways these criteria can be portrayed or constructed. The structural pieces are then evaluated and reevaluated until the whole piece becomes structurally sound, well-balanced, and aesthetically pleasing. Actually, by the time I get to form and aesthetic, much has already been predetermined. Following this tack, I do not use a great deal of flashy detail, for the structural elements comprising the works compose most of the detail.

GIMBALED TABLE

Gimbaled table



Rendering of gimbaled table

PLATE II

My two major works for this thesis are speculative pieces. Not having the luck to find a specific boat to design for, I researched proportions common to many vessels and built pieces for a theoretical boat. My wife and I hope to be able to utilize these pieces in a boat of our own some day.

The first piece is a gimbaled table/liquor cabinet combination. It is designed to function within the interior of a yacht about 35 or more feet long with 6 or more feet of headroom. It is sized to fit into a typical dinette situation found on many boats in this size range. My intention with this piece was to construct as state-of-the-art, seakindly, and artistic a piece of yacht furniture as my abilities would allow. This meant using modern materials, adhesives, construction techniques, and styling, though tempered with a bit of the old to give the piece some tradition. The aesthetic and form are drawn directly from its function.

Because I wanted a piece as state-of-the-art and seakindly as possible, gimbaling became a major criterion. How necessary a gimbaled table is aboard a sailing yacht is a subject of much debate. Competent deep-water sailor Donald M. Street, Jr. is very much in favor of gimbaled tables. Street is

the author of the two volumes of The Ocean Sailing Yacht. In these volumes he states:

> Every boat, no matter how small, should have a gimbaled table, even if it is only 1 or 1½ feet square. Though not very large, such a table does provide a place to put things down, making it possible to relax and eat. You can cruise without a gimbaled table--and you can hit yourself over the head with a hammer--but how much more pleasant life becomes when you stop![4]

> A cruising boat should have a gimbaled main-cabin table. If the table is not gimbaled, the cook must serve each person individually, since he cannot place bowls or platters of food on the table. Furthermore, it is difficult to eat at sea without a gimbaled table. The knife and fork take two hands, and no hands are left to steady the cup and plate. Some of the ocean racers with a high ratio of ballast to displacement no longer have gimbaled tables because the boats are so stiff and their motion is so quick that the tables begin to oscillate and everything falls off. On some boats this situation has been corrected with a brake on the pivot that slows the motion down; . . .[5]

The liquor cabinet became a multi-functional part of this piece. To operate effectively, a gimbaled table must have a low center of gravity as part of the swinging table itself. This enables a plate or bowl to be placed on one side of the table without greatly upsetting the balance of the table surface. Lowering the center of gravity in this

case was accomplished by attaching the liquor cabinet to the bottom of the table. The cabinet has space to accept five 1-quart bottles of liquor. Since there are about 8 pounds per gallon of liquid, this adds almost 10 pounds of ballast in liquid alone. An additional 8 pounds of lead ballast are embedded within the bottom structural member of the cabinet (Figure 2, Plate III). The center of gravity is lowered further by the addition of the weight of the cabinet itself plus the weight of the glass of the bottles.

Another device to deal with the center of gravity problem is the use of a lightweight core material, Nor-Core, as the substrate in the table top itself. This material is a plastic honeycomb (Figure 3, Plate III). It is sandwiched between a thin layer of plywood and veneer to give the table top the look of solid wood. Besides reducing the weight at the ends of the table and greatly increasing the effectiveness of the liquor cabinet's low center of gravity, the Nor-Core also reduces the weight of the entire piece of furniture.

With the main cabin being the social center of a yacht's interior, it seems only natural that the ship's spirits be stored nearby. And the drinking of

Figure 2. Leaded structural member of gimbaled table

Figure 3. Nor-core

PLATE III

spirits has been a long-time tradition aboard ships. Sailing vessels of old were reknown for being some of the most uncomfortable places on earth. The British Navy, in 1687, began issuing a daily rum ration to combat the lack of comforts aboard their seagoing vessels. This was done to reduce one's sensitivity (possibly an early seakindly element). By 1740, the ration had reached an amount of one pint per man per day. The rum ration was issued until 1970.[6]

It is this drinking tradition which has given us some of the colorful sayings we have today. "Splice the Main Brace!" refers to a double ration of rum given to the men after a job well done or before a particularly tough battle. "Tap the Admiral!" originates from the time of Admiral Lord Nelson's death in battle at sea. According to legend, because of his social stature, Lord Nelson was not given the traditional burial at sea but was returned to England. For safe keeping en route, he was sealed in a barrel full of cognac. When the ship reached port and the barrel was opened, all it contained was Lord Nelson. Apparently, an industrious sailor had been tapping the barrel and selling extra rations to the other sailors!

(Could it be because of the lack of comfort, coupled with tradition, that social drinking--the daily "sundowner" or cocktail hour--has become so established within the yachting community?)

The table needed a means by which it could be suspended. This was achieved by pinning the table between posts which would extend from the cabin sole to the ceiling. These posts curve outward as they approach the coachroof, triangulating the structure somewhat. They also provide handholds to ease passage through the cabin layout, a seakindly feature.

Another feature which influenced the form of this piece was the inclusion of a large radius, 10 inches, on the corners. This is a seakindly feature which helps greatly when one enters into or exits from the dinette.

There is a continuous fiddle encompassing the table. It has no sharp edges or corners to cause injury should someone fall onto it. The fiddle is low, about 3/4 of an inch in height; but, since the table is gimbaled, the need for a higher fiddle is greatly reduced.

The hardware or mechanical pieces of the table comprise most of the flashy detail. These pieces are the gimbaling pins, table locking pins, liquor cabinet door handles, pads to bolt the table

in place within the interior, and a device enabling the table posts to be shortened one inch, easing their installation.

The gimbal pins are specially made bolts (Figure 4, Plate IV). They have large teflon washers and a split nut locking system. The teflon washers are part of the rhythm dampening system. One nut is used to tighten down on the teflon washers, adjusting the braking action. The other nut is used to lock down the whole assembly, keeping the inner nut from changing its adjustment.

The locking pins allow the table to become rigid (Figure 5, Plate IV). This reduces wear on the gimbaling assembly. It also makes the table more seakindly when not in use by making it a more suitable handhold.

Twin doors allow access into the liquor cabinet. These doors swing open 180 degrees to lay flat atop the table. This puts the doors somewhat out of the way and allows the door bottoms to be used as counter space. For the doors to lie flat atop the table meant the door handles had to be recessed within them (Figure 6, Plate V). This was accomplished by silver soldering brass sheet stock to some brass tubing and letting the two handles

Figure 4. Table gimbal pin assembly

Figure 5. Gimbal locking pin assembly

PLATE IV

Figure 6. Liquor cabinet door handles

Figure 7. Table installation mechanism

PLATE V

into their respective doors.

The last major pieces of mechanical hardware constructed for this piece of furniture were the devices to ease the table's installation (Figure 7, Plate V). Basically, they are brass tubing let into the bottoms of the table posts. These tubes have brass rods travelling within them. Each rod is slotted and pinned to control its length of travel. The whole assembly is then locked open with a pair of collars. There are four of these assemblies all together, two in each system.

Once the functional aspects of the piece had been thought through, the final form and aesthetic were developed. The aesthetic of the piece consists of a mixture of lines and curves. An effort was made to maintain a good crisp image while keeping the soft edges of the functional requirements. I also wanted to try to capture a blend of traditional and modern elements. A good example of the traditional feeling I wanted to capture can be seen within the interior of the Gloucester fishing schooner L.A. Dutton (Figure 8, Plate VI). The linear pattern set up by the multiple slats composing the bulkheads within this interior provided the primary traditional influence for me in this table.

Figure 8. L.A. Dutton interior

Figure 9. Gillmer 39 interior, courtesy Ryder Yachts

For the modern aspect, I chose a blend of curves created by the use of sophisticated bending techniques. Such use of curves can be seen in the very contemporary interior of the Gillmer 39, a production boat designed by Thomas Gillmer (Figure 9, Plate VI).

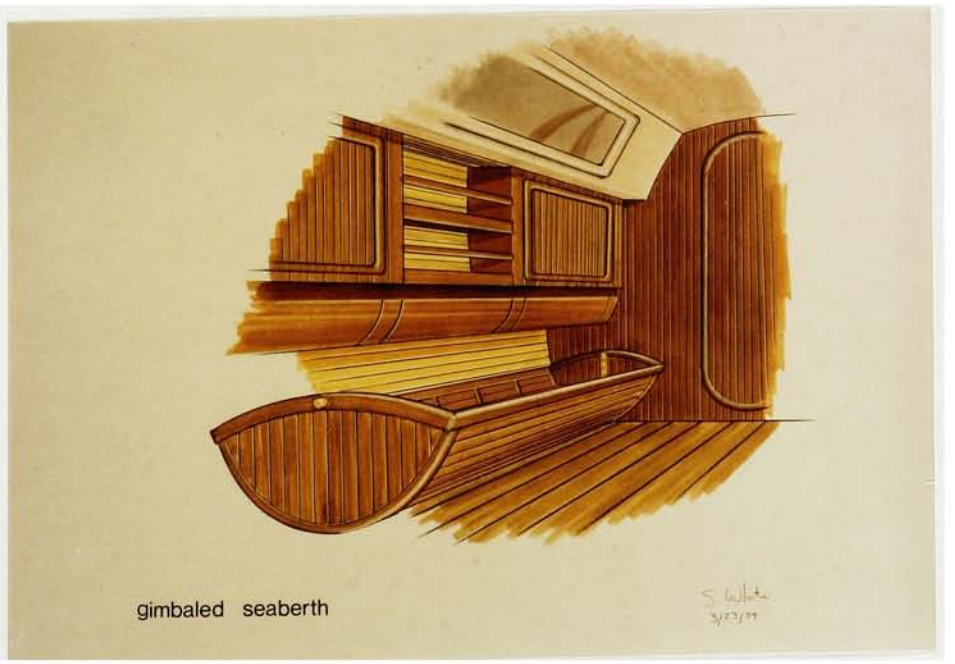
The upward and outward flair of the table posts, I feel, lends an elegance and lightness to the table as a whole with the added bonuses of enhancing the use of the posts as handholds and minimizing their obstructing one's feet. The shape of the liquor cabinet reinforces this flair form while adding to its seakindliness with a rounded bottom.

The wood I chose for this piece is mahogany. Though there are a variety of woods being used for boat interior work today, the two primary woods are teak and mahogany. Both are extremely stable with very low shrinkage percentages: 4.0% shrinkage along its tangential for teak and 5.1% for mahogany, according to R. Bruce Hoadley in Understanding Wood.[7] With the nature of this piece being speculative, I felt my best bet for incorporating it into a future interior would be to utilize one of the more commonly used woods. With the high price of teak, mahogany

became the most logical choice. For the same reasons, I chose mahogany for the gimbaled seaberth, the second piece in this thesis.

GIMBALED SEABERTH

Gimbaled seaberth



Rendering of gimbaled seaberth

PLATE VII

The second of my major thesis pieces is a gimbaled seaberth. Though gimbaled tables can be found in some abundance, I was unable to find any examples of gimbaled seaberths within modern interiors. Researching historical precedents, I came across this example of a captain's seaberth aboard the sailing vessel Packard (Figure 10, Plate VIII).

Another historic example, one from which the whole idea stems, is the hammock.

> . . . from the Carib hamorca, [the hammock is] a type of native bed, and the bed of the naval seaman for hundreds of years. . . . The hammock was invented, it is said, by Alcibiades, but its introduction in ships dates from the time of Christopher Columbus who noted that the natives of the Carib islands used them slung between trees. The maritime version is made of canvas with a row of small eyelet holes at each end through which are rove nettles which spread from a ring, the nettles as a whole being known as the clews of the hammock. When used on board, hammocks were slung from hooks in the deck beams. When not in use they were lashed up, with the blankets inside them, by nine turns of rope; and in the event of shipwreck or disaster in battle, a properly lashed hammock was capable of supporting the weight of a man in the water for a considerable time.[8]

Another example of man's attempt to remain level while sleeping at sea can be seen in this etching from the Journal of a Landsman (Figure 11,

Figure 10. Packard seaberth

Figure 11. Early wooden hammock, courtesy Tudor Publishing

PLATE VIII

Plate VIII). It portrays the sleeping arrangements aboard a yacht en route from Portsmouth to Lisbon.

A major concern in the design of the gimbaled seaberth was to make the berth as compact as possible and still stay in accordance with the comfort zone of human factors. The comfort zone for width is 20 inches minimum to a maximum of 26 inches. Seaberths are designed to be narrow compared to a domestic bed of 36 inches. The idea is to be able to brace one's self within the berth. Length is a minimum of 67 inches to a maximum of 78 inches. These measurements are based on an average man's height of 70 inches. These factors make up a large part of the proportions of the actual berth which has a mattress size of 23 inches by 78 inches.

Another major concern which influenced the final size and form of the berth was the relation of the berth to the hull. The berth had to be designed so that it could be mounted up close to the hull without striking it as the boat heeled and rolled around the berth. This meant the greatest distance the carcass of the berth could have would be the distance from the pivot point of the gimbal to the outside edge of the upper rail.

The form of the berth is drawn directly

from its function. The aesthetic is designed to relate closely to that of the gimbaled table. The two were conceived to be compatible pieces placed within the same interior.

All the weight of the structure is designed to be taken on the pivot points. The points are fabricated in brass and are positively fastened to the end panels. This is done by means of a brass strap which then is fastened securely to a hollow box traversing the length of the mattress platform (Figure 12, Plate IX).

The box section serves a dual purpose. First, it gives much needed strength to the mattress platform. Secondly, it assists in lowering the center of gravity. With the compact nature of the piece, the center of gravity could tend to be a little high. The center of gravity can be lowered by placing ballast in the lidded box.

The seaberth is designed to be hung by the pivots from two bulkheads within a yacht interior. Fastened to each of the bulkheads would be a piece of hardware designed to accept the pivot points (Figure 13, Plate IX). Made of brass, this hardware is similar to a pillow block and is lined with teflon. The upper half of the block clamps down on

Figure 12. Seaberth gimbaling pin and strap

Figure 13. Seaberth gimbal pivot blocks

the pivot point, holding it securely in place, while the teflon becomes the braking surface of the dampening system, counteracting any rhythm the berth may develop.

The mattress platform is pierced with a series of holes along its length and a gap remains between the edges of the platform and the carcass of the berth. These spaces serve to promote as much ventilation as the design will allow, for it has been found that the human body can lose as much as $1\frac{1}{2}$ pints of perspiration while sleeping.

POLE-MOUNTED TABLE

Pole-mounted table

Rendering of pole-mounted table

PLATE X

The third and final piece constructed for this thesis is a sliding, pole-mounted cocktail table. This is a commission piece, designed for the Island Trader Tzu Yu, a 45 foot ketch owned by Tom and Beverly Wright. Since my thesis is aimed at yacht interiors, I felt it was important to design and construct at least one piece which would go into an actual interior.

For this piece I had a particular list of criteria. The table was to be mounted on a stainless steel pole that steps between the main mast and the keel. It could not be slid down onto the pole but had to be mounted around it. This meant the table had to come apart somehow. The table had to be able to slide down into position for cocktail hour and up to the overhead, out of the way, when not in use. Therefore, both the top and the bottom of the piece had to be visually appealing. The mechanism operating the table's movement was not to alter the pole in any way. Because of the space allotment of the coachroof, the dimensions of the table could not exceed 21 inches by 27 inches. Finally, the table was to be of solid teak to complement the large amount of teak already in the boat's interior.

The table comes apart into halves for

mounting and is bolted together with four stainless steel screws (Figure 14, Plate XI). There is a beam system underneath to give the unit strength. The sides of the beam system are beveled and tapered to make them more visually appealing.

The table can be adjusted to any height along the length of the pole by way of a clamping collar (Figure 15, Plate XI). This collar is fabricated in brass and is heavily reinforced. It is lined with rubber and is operated by a handscrew.

The clamping system is designed to be invisible from the table top and practically invisible from below. The adjustment screw is the only really visible part of the system. The knob is designed to jazz up and fit in aesthetically with the piece.

All external corners of the table are well-rounded, in keeping with a seakindly attitude, with small bevels put on the edges to bring back a crisp feeling to the piece. Because of the expansion and contraction inherent in solid wood, the corners have been left free of any fiddle, though these gaps were left small enough to prevent a glass from sliding through. These openings also facilitate wiping crumbs from the table surface. The fiddles are low, but then the primary use of the table will be while

Tzu Yu is moored or at anchor, not when she is at sea. The lower profile of the fiddles aids in compacting the piece to the coachroof.

Figure 14. Pole-mounted table apart

Figure 15. Pole-mounted table clamp

PLATE XI

CONCLUSION

Trying to develop a thesis of this type--with pieces designed for the curves and specifications of a hull and yet which also must be viewed in a gallery environment--is not an easy task. Much of what goes into yacht interiors are built-ins and the like. My attitude toward selecting pieces for this work was to choose pieces of furniture which would lend themselves to a maximum of seakindly ingenuity but which could also be viewed as works unto themselves and could, therefore, be viewed more conventionally within a gallery setting. For them to be shown in such a setting required special, but visually minimal, staging.

My education in the arts has given me a great interest in combining form, function, and the manipulation of materials, particularly wood and metal, my favorites. My minor has been in industrial and interior design, emphasizing the design and layout of yacht interiors. Designing and building furniture seems a perfect opportunity to fulfill these interests.

I grew up around boats and the sea and started sailing when I was seven. These are, and always will be, loves of mine. In the not too distant future, my wife and I would like to live aboard a sailing vessel, seeing the world and working on boats as we go. To me, this would be living research, deepening my knowledge of living arrangements, sea-kindliness, and the necessities of life aboard a sailing vessel. Building fine wood interiors for yachts seems to be a natural way to combine my loves and my creative interests.

Sunrise and Mary Day

FOOTNOTES

[1]R.H. Dana, Jr., Two Year Before the Mast (New York: P.F. Collier and Son Company,1909), p. 11.

[2]Gershom Bradford, The Mariner's Dictionary (New York: Weathervane Books, 1952), p. 228.

[3]Peter Kemp, ed., The Oxford Companion to Ships and the Sea (New York: Oxford University Press, 1976), p. 343.

[4]Donald M. Street, Jr., The Ocean Sailing Yacht, vol. 2 (New York: W.W. Norton and Company,1978), p. 323.

[5]Donald M. Street, Jr., The Ocean Sailing Yacht, vol. 1 (New York: W.W. Norton and Company, 1973), p. 364.

[6]Kemp, op. cit., p.357.

[7]R. Bruce Hoadley, Understanding Wood (Newtown, Connecticut: The Taunton Press, 1980), p. 74.

[8]Kemp, op. cit., p. 372.

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